Genius, Creativity and (Not) Eating Meat

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Chapter 13
Genius, Creativity and (Not) Eating Meat

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ABSTRACT

A major hypothesis argues that the dietary shifts of the proto-humans towards animal proteins enabled humans to develop large brains as well as build planning, cooperating, socializing, exploring and creative skills, related to food techniques, including using fire, cooking, fermentation, agriculture and animal domestication. Many million years later, human population has drastically increased and livestock has grown even faster creating unprecedented global environmental, climate change and health challenges. This chapter asks whether animal meat continues to be essential for human nutrition. It refers to prominent people in human history considered geniuses because of their creative and intellectual abilities. It explores whether there is a link between genius, creativity and eating meat and answers this in the negative based on well-known geniuses who have negated the meat-eating diet. Social marketing can anchor some of its techniques in using such personalities as role models for changing the current high dependence on meat.

INTRODUCTION

The modern human brain is the largest and most complex organ among the living primates. Constituting only about 2 percent of the human body, the brain is responsible for all body functions (NMNH, 2017). The major causes for the physical growth and creativity of the human brain have been of boundless research interest.

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A major hypothesis about the evolution of the human brain relates to dietary shifts in the human nutrition (Schoenemann, 2006). According to the anthropologists (Joyce, 2010), the proto-humans started consuming a diet rich in animal proteins, especially meat, with the use of fire and cooking. Animal protein from the meat initially provided sufficient nutrition and energy for the physical growth of the human brain. Subsequently, the increased brain size positively influenced the development of intelligence, and hereby enabled humans to plan, cooperate and socialize (Smil, 2013). Although anthropology tells us something about the positives of eating meat linked to physical growth and the relative size of the human brain, it does not convey anything about creativity and talent We do not know whether eating meat has contributed to the development of exceptional intellectual, creative, knowledge and wisdom abilities and talents associated with being a genius. There are also some other major dietary shifts in the human evolution, including cooking, fermenting, plant growing, animal domestication and agriculture (Luca et al., 2010).

According to Dunn (2012) from the Scientific American, human ancestors were nearly all vegetarians, and the human digestive systems evolved as the practices of growing, producing, processing and preparing food developed. The gut microbiota seems to have evolved too and in fact varies according to the adopted food practices. For instance, some populations in Japan have bacteria in their guts allowing them to break down seaweed – a foodstuff popular for them and not so common in other places (Dunn, 2012).

Humans evolved with eating meat (Gupta, 2016), supplied with no guaranteed luck by male hunter-gatherers, but also with good quantities of fruits, vegetables, roots, seeds and nuts collected by females. Later agriculture allowed the ploughing of the land to produce crops, followed by domestication of animals. Although meat does provide some valuable micronutrients and essential fats, according to Prof. Peter Ungar it is carbohydrates, not meat that fuel the human brain (in Despain, 2012). He also explains: "The hominin lifestyle is more about a broadened niche than meat per se… Lots of people live in lots of places because they can find something to nourish themselves… Western Australian aboriginals did quite well without lots of meat" (Ungar in Despain, 2012).

The evolution came after the discovery of fire, which enabled humans to cook their meat to increase its digestibility, making it more tender, tastier and even reducing the risk of infection (Ali, 2015, p. 25). Actually, cooking or heat treatment was more important than meat for the evolution of the human brain. According to Herculano-Houzel (2012, p. 10667), "the advent of the ability to control fire to cook foods, which increases enormously the energy yield of foods and the speed with which they are consumed…, may have been a crucial step in allowing the near doubling of numbers of brain neurons that is estimated to have occurred between *H. erectus* and *H. sapiens*". The use of fire freed up time from chewing to obtain the daily calorific intake, which humans used to their advantage developing remarkable cognitive abilities (Herculano-Houzel, 2012).

Cooking starch-rich vegetables and grains – that is digestible carbohydrates, was necessary in human evolution "to accommodate the increased metabolic demands of a growing brain… cooked starch, a source of preformed glucose, greatly increased energy availability to human tissues with high glucose demands, such as the brain, red blood cells, and the developing fetus" (Hardy et al., 2015, p. 252). Based on these findings, the researchers point out: "'Eating meat may have kick started the evolution of bigger brains, but cooked starchy foods together with more salivary amylase genes made us smarter still" (in Millner, 2015)

Controversially, according to Rettner (2009), there are three other hypotheses trying to explain why human brains today are so big: climatic changes, ecological shifts away from the equator with less parasite exposure and social competition. Of the three hypotheses, recent studies suggest that social competition for scarce resources may be the major cause. In any case, the issue remains a matter of debate.

According to Prof. Hurlbut from California University, people with bigger brains are not necessarily smarter than those with smaller brains (in Hirshon, 2017). There is only weak correlation between brain size and intelligence. Hirshon (2017) compares the size of the brain of Anatole France (a French author who won the 1921 Nobel Prize in Literature) and that of Jonatan Swift (the author of "Gulliver's Travels") which was twice bigger despite both of them being extremely talented. Besides size, a range of other factors, such as density of nerve cells per area, nutrition quality and environmental stimulation, probably contribute to how well a brain functions (Hirshon, 2017).

However, humans are both biological organisms and social beings in interaction with their environment (Bubolz & Sontag, 1993). We may ask ourselves whether eating meat is still necessary for the proto-humans' 21st century descendants. If we look at the history's pages, we find many outstanding people who did not consume meat. For instance, the inventor Nikola Tesla advised: "practically abstain from meat… Stay away from acid, keep a vegetarian diet" (Wrots, 2016). Many people regarded as geniuses were vegetarians, including Leonardo da Vinci, Gandhi, George Bernard Shaw, the Nobel Prize-winning mathematician Norbert Wiener, Isaac Newton and Albert Einstein (Weiner, 2016).

TRACING THE HISTORY OF EATING MEAT

There is no doubt that animal meat has played an important role in human evolution and survival. The proto-humans were eating roots, wild berries, fruits, vegetables and nuts to stay alive. By adding animal flesh to their diet, they were able to reduce the energy required for the foraging of vast land areas in search of food. According to the evolutionary biologists Zink and Lieberman (2016), *H. erectus* started consuming a much more calorie-rich diet with animal proteins which resulted in the need for less chewing cycles and total masticatory force. This meant a significant saving in time and calorie-burning effort for the early humans (Kluger, 2016).

In the opinion of the evolutionary anthropologist Aiello (in Ireland, 2008), there is evidence in the fossil record for a human animal-based diet, such as animal bones from 2.5 million years ago with cut marks thought to be from the earliest stone tools and species of first hominids who had strong jaws and molar-like teeth (Ireland, 2008). Meat was plentiful on the African savannah in East Africa, where the humans first evolved, and then dispersed outwards (Maslin et al., 2015). This is where meat stepped. Another set of nutrients came from seafood, such as fish and shellfish, which provided dietary sources of omega-3 fatty acids for humans' brains (Mouritsen, 2016). According to Aiello (1997), animal-based proteins are only one aspect of the brain evolution. Other contributing factors include terrestriality with large group sizes, bipedalism freeing the forelimbs, more complex foraging behaviour, adaptation to climatic variability, necessity for behavioural flexibility and social intelligence (Aiello, 1997).

Later, environmental constraints related to high population densities coupled with traditional and cultural adaptations often linked to religious commandments and economic affordability made meat a relatively rare food in rural societies (Smil, 2013). Within the second half of the 19th century, in-

dustrialization and urbanization resulted in more frequent meat eating in Europe and North America followed by Asia and Latin America as part of the post-World War II modernization (Smil, 2013). The year 1959 was a turning point in population growth when the number of people on the planet reached 3 billion and was set to double to 6 billion in the next 40 years (Smithsonian, 2010). Meat production and consumption however more than tripled between 1961 and 2001 – increasing from 71 to 232 million tonnes (FAOSTAT, 2017).

This enormous raise in meat production and consumption is adversely influencing all aspects of human life and humanity's long-term survival prospects. It is contributing to global greenhouse gas emissions, land and water pollution and depletion, biodiversity loss, antimicrobial resistance, and is also negatively impacting on human health (Raphaely & Marinova, 2014 and 2016). Irrespective as to what role meat played millions of years ago in human evolution, humanity is now faced with unprecedented challenges to reduce and even eliminate meat consumption in order to deal with climate change and safeguard the planet's ecosystems. Environmental values and priorities dictate a new understanding – to the one evolutionists, biologists and anthropologists hold, of the role of meat in human diets.

However, is reducing or eliminating meat from people's diet going to impact on human creativity and intellectual abilities? We answer this negatively by looking back in history at exceptional minds who were vegetarian and achieved extraordinary heights in creativity, innovation, versatility and human brilliance. These geniuses were able to set their marks in human evolution in all walks of life and represent role models that social marketing can use to send the message that remarkable human performance does not have to rely on meat intake. Many of the examples we use are people who have lived in times when there was much less pressure to conserve the planet's ecosystems and climate change was yet to be defined as an existential threat to humanity. In their decision to abstain from meat, these geniuses were guided by other priorities and values, such as respect for non-human animals, rejection of violence and desire to live long, happy and healthy lives. Irrespective as to what the reasons for these outstanding people were to be vegetarian, the message of this chapter is that this did not impact on their creativity and exceptional talents. It is time to put the role of meat in human evolution aside and face the reality of the 21st century which requires urgent responses to climate change and preserving the planet's ecosystems.

THE GENIUS MINDS

What characterizes the geniuses' exceptional minds? It is a combination of creativity, curiosity, attentiveness to everything, natural abilities and brilliance. The historian McMahon (2013) describes the genius as a misfit, martyr, loner and rebel but also hard-working individual. Using the remark of one of these geniuses – Thomas Edison: "Genius is 1 percent inspiration and 99 percent perspiration" (The Phrase Finder, 2017). First used two-thousand years ago by the Roman author Plautus, the word genius described individuals "who possess rare and special powers: the power to create, redeem and destroy; the power to penetrate the fabric of the universe; the power to see into the future or to see into our souls" (McMahon, 2013, p. xix). The English Oxford Living Dictionaries (2017) define genius as those, who are exceptionally intelligent, have exceptional creativity or other natural ability or are simply very clever. Geniuses have made many of the great discoveries and developments in the sciences and the arts (Barker, 1998).

What makes a person a genius is a very complex matter which has something to do with genetics, education and training, personality, psychology and perhaps diet, the food that fuels the greatest mercurial minds. The foods humans consume play a crucial role for the healthy brain functions, encouraging memory, learning and creativity. In fact, the microbiome of the guts influences all organ systems of the body, including the brain (Korn, 2014). Many geniuses specifically preferred plant-based food. The list includes Pythagoras, Isaac Newton, Leonardo da Vinci, Nikola Tesla, Albert Einstein, Thomas Edison, Franz Kafka, Leo Tolstoy, Benjamin Franklin all of whom claimed to be vegetarian. To this list can also be added more contemporary prominent vegetarian geniuses such as Steve Jobs (Apple Computer) and Steven Hawking (the famous paraplegic physicist).

Being fervent about vegetarianism, some of these great minds have expressed their personal reasons for the chosen diet: "Vegetarianism has a powerful influence upon the mind and its action, as well as upon the health and vigour of the body. Until we stop harming all other living beings, we are still savages" –Thomas Edison, and "Nothing will benefit human health and increase chances for survival of life on Earth as much as the evolution to a vegetarian diet" – Albert Einstein (Florida News Group, n.d.). Nikola Tesla who shifted gradually away from a meat diet wrote regarding the physical and moral benefits of vegetarianism: "It is certainly preferable to raise vegetables, and I think, therefore, that vegetarianism is a commendable departure from the established barbarous habit. That we can subsist on plant food and perform our work even to advantage is not a theory, but a well-demonstrated fact" (Tesla, 1900, p. 180).

GENIUSES' EATING SECRETS

There are many complex factors, including neurological (Oikkonen et al., 2016, Jauk et al.,2015; Ridley, 2010; Mayseless et al., 2015; Falk et al., 2013; Shi et al., 2017), psychological such as mental disorders and dyslexia (Heilman, 2016; Leutgeb et al., 2016; Andreasen, 2011; Kéri, 2009; Zhang et al., 2016), genetic (Dietrich, 2014; Borreli, 2016; Kéri, 2009; Oikkonen et al, 2016; Zabelina et al., 2016; Reuter, 2006; Mayseless et al., 2013), education and training (Rettner, 2009; Shamay-Tsoory et al., 2011; Sun et al, 2016), which distinguish the genius brain from the ordinary normal human brain. Is diet also a significant factor for being a genius?

It is known that the best brain-boosting foods are vegetables or plant-based products including blueberries, avocados, beetroot, broccoli, celery, coconut oil, dark chocolate, extra virgin olive oil, walnuts, green leafy vegetables and herbs (Bailey, 2013). The same plant-rich food formula appears to have worked for many of the world geniuses (Ahn, 2014). Scientific studies show correlation between eating vegetables and fruits and higher IQ (Alleyne, 2011), connection between a country's level of chocolate consumption and its per capita number of Nobel laureates (Messerli, 2012) and a link between the plant pigment lutein in leafy green vegetables and healthy brain aging (Breyer, 2016).

The greatest minds needed and were stimulated by certain foods and drinks to keep them in shape, awake and inspired. What you eat has a profound influence on brain function, one of the greatest genius of all time Da Vinci said (Gelb, 2000). Some of the world geniuses have quite attained taste and unusual dining habits. They used nicotine, caffeine, cocoa and alcohol to start and end the day. Beethoven ("Only the pure of heart can make a good soup"[1]), Victor Hugo ("First it was necessary to civilize man

in relation to man. Now it is necessary to civilize man in relation to nature and the animals"[2]) and Balzac ("Great love affairs start with Champagne and end with tisane"[3]) consumed too many cups of coffee a day. Tolstoy ("As long as there are slaughterhouses, there will be battlefields"[2]), Gustav Mahler ("You will appreciate how full I am of this idea [vegetarianism] when I tell you that I expect it to work the regeneration of mankind"[4]), Jean-Paul Sartre ("Man is condemned to be free; because once thrown into the world, he is responsible for everything he does"[5]) and Mark Twain ("Whenever you find yourself on the side of the majority, it's time to pause and reflect"[6]) ate too many eggs (Weiner, 2016). Picasso ("An idea is a point of departure and no more. As soon as you elaborate it, it becomes transformed by thought"[7]) consumed mineral water, milk, vegetables, fish, rice pudding and grapes. Tesla ate fresh vegetables, fish and meat sparingly and rarely till he totally removed the latter two from his diet (Ahn, 2014). Benjamin Franklin ("Flesh eating is unprovoked murder"[2]) ate many apples and cranberries but was also extremely fond of pickles (Franklin & Marshall College, 2008).

These notable geniuses respected the benefits of their meat-free lifestyle, they were analyzing the essence of the food they consumed. Nikola Tesla believed longevity has very much in common with controlling passions and appetites, saying humans are overeating especially the wrong kind of food. Potatoes for Tesla were among his preferred food: "Potatoes are splendid, and should be eaten at least once a day. They contain valuable mineral salts and are neutralizing" (Wrots, 2016). Although adopting vegetarianism in his late ages, Albert Einstein appears to have supported it throughout all his life, writing to Max Kariel in 1953: "I have always eaten animal flesh with a somewhat guilty conscience" and later with quite an enlightenment: "Vegetarian food leaves a deep impression on our nature. If the whole world adopts vegetarianism, it can change the destiny of humankind" (Calaprice, 2010).

The foods and drinks the exceptional minds preferred to consume are loaded with nutrients which positively affect the cognitive functions: flavonoids in cocoa, green tea, wine (higher in red wine) and dark chocolate, vitamin D in milk and cereal grains, combination of vitamins C, E and carotene in citrus fruits, vegetables, nuts, peanuts, olives, choline in egg yolks and lettuce, calcium, zinc and selenium in milk, beans, nuts, almonds, whole grains, nuts, cereals and eggs (Gómez-Pinilla, 2008). Steve Jobs existed primarily on dates, almonds, lots of carrots and weeks of fasting (Weiner, 2016).

Excessive meat consumption is not neutral for the human brain and can cause severe problems. The saturated fat consumption associated with red meat might trigger negative changes in the cognitive function of the human brain, damaging its memory (Sifferlin, 2012, Health & Fitness Advisory, 2013). A study suggests that high intake of omega-6, which is found in red meat and dairy is positively associated with cognitive impairment and brain allergies (Melendez, 2010, p. 24-25). One further study refers to the danger of Mad Cow Disease (21st century) and the sheep Scrapie disease (in the 1700s) affecting human brain (Cox, 2002) questioning whether or not they can be transmitted to humans as seen in the Creutzfeldt-Jakob degenerative disease, affecting the brain and neurological system. Processed meat can induce memory loss and increase Alzheimer's disease (Wegerer, 2014) in a similar way as a diet high in grilled and well-done meat can impact brain health and cause dementia and Alzheimer's (Pollack, 2015).

Against this background, the question that arises is actually not whether excluding meat from human diet would impact on creativity and intellectual capacities but whether we still need to eat meat. This is particularly relevant to situations where people have a choice and consuming animal proteins is not a matter of survival or death.

DO WE STILL NEED TO EAT MEAT?

It is difficult to argue that there is a secret link between genius, creativity and not eating meat. We have selectively chosen exceptional personalities who have excluded animal flesh from their diets on their own volition. These examples show that meat is not necessarily a brain food. A large group of world geniuses turned into vegetarianism and affirmed its advantages not only from a compassion and morality point, but because of realizing that abstaining from meat is good for human health, body and brain, for the animals and the planet as a whole. Their geniality helped them to see this (Elephant Journal, 2011; Turner, 2012). Several more quotes in support of this position:

Our task must be to [widen] our circle of compassion to embrace all living creatures and the whole of nature in its beauty[8] *– Albert Einstein*

The greatness of a nation can be judged by the way its animals are treated[9] *– Mahatma Gandhi*

A man can live and be healthy without killing animals for food; therefore, if he eats meat, he participates in taking animal life merely for the sake of his appetite. And to act so is immoral[2] *– Leo Tolstoy*

Global warming could be controlled if we all became vegetarians and stopped eating meat… giving up pork chops, lamb cutlets and chicken burgers would do more for the environment than burning less oil and gas[10] *– Alan Calverd, British physicist*

Eating meat might be what fueled human brains million years ago. However, humankind's historic evolution does not take into consideration the devastating impacts on the environmental and human health presently faced. Today, 70 billion animals are slaughtered every year to be consumed by 7 billion humans (Bogueva & Phau, 2016). Global meat production has expanded more than fourfold in the last five decades and continues to rise to a new peak, according to the United Nations Food and Agriculture Organization (FAO) (Renner, 2011, p. 56), due to consumers' growing purchasing power, urbanization and changing diets. Limiting the environmental and health impacts caused by meat production and consumption worldwide involves not only knowledge of how much meat people eat, but also about the meat type consumed. Most low-income and developing countries are at various points along the rapidly ascending phase of their meat consumption growth curves, but some are already approaching the upper bend (Kearney, 2010), including China (Bogueva et al., 2017).

Today, a meat-rich diet may not always be good for the modern humans and their brains. The adoption of uniformed excessive meat consumption habits (Ali, 2015, p.9) and modern livestock production are posing an unprecedented threat to the limited resources of the planet as well as human health (Raphaely & Marinova, 2016). The long-term consumption of meat is associated with an increased risk of mortality, cardiovascular disease, colorectal cancer and type-2 diabetes, in both men and women because chronic high protein intake, the studies suggest, may result in digestive, renal and vascular abnormalities (Wu, 2016). It is clear that we no longer need to eat meat.

THE HUMAN PRICE OF MEAT-PRODUCTION SYSTEMS

The discussion over the human desire for meat foments all kinds of passion. However, the environmental and human health related facts are hard to ignore (Kaye, 2014). Shall we see the enormous cost of excessive meat production and consumption on the survival of life on Earth, their contributions to environmental crises such as climate change and biodiversity loss, and human health? If not restrained, by the middle of the 21st century, unnecessary meat production and consumption will continue to pose a threat to the biosphere's integrity. The expanded farming operations, extensive conversion of tropical forests into new pastures and mass-scale feed industry will trigger serious concerns, related to the gaseous emissions from livestock, water depletion and degradation from fertilizers-manure and other agrochemicals, land misappropriation and deprivation, biodiversity and rapid species loss (FAOSTAT, 2003; Smil, 2013; Raphaely & Marinova, 2014).

According to the statistical facts given by Wolchover (2012), OSU (2012) and USGS (2016), there is excess water-depletion and pollution in meat production (1,890 litres for 450 grams of chicken meat production and 1,750 litres for 113 grams of hamburger beef production). More than 400 different gases are released in the air from factory livestock facilities and in the US, "animal feeding operations annually produce about 100 times more manure than the amount of human sewage sludge processed in US municipal wastewater plants" (Grace Communications Foundation, 2017).

Cattle consume 17 times more grain calories than they produce as meat calories (Eshel et al., 2014). People in India consume about 200 kilograms of grain per person each year (Brown, 2009). At that level of consumption, the total current grain harvest could support 10 billion people on the planet (Brown, 2009). On the other hand, in the US people consume 800 kilograms of grain per person each year, including for food and animal feed with livestock eating much of it. At that level of consumption, the Earth can support only 2.5 billion people creating world hunger, starvation and food-related conflicts. These facts can no longer be ignored, given that agriculture is the sector with the highest greenhouse gas emissions on a 20-year horizon (IPCC, 2014).

Furthermore, in the last 60 years food-producing animals massively consume most of the antibiotics manufactured (100,000–200,000 tonnes per year) across the world (Tekiner & Özpınar, 2016). The World Health Organization defined antimicrobial resistance (AMR) as "biohazard", and declared that AMR is present in every country (WHO, 2016). The repeated preventative overuse of antibiotics can develop antibiotic resistance in the bacteria and in the environment. This continued evolution limits the ability to treat bacterial infections. The A "worst-case" scenario for AMR suggests that by 2050 cumulative global economic losses would reach $120 trillion and 444 million adults would have died or not been born (RAND Corporation, 2016).

Sixty percent of all known infectious diseases are zoonotic in origin, and 75% of the new human pathogens reported in the past 25 years originated in animals (Tomley & Shirley 2009). Animal husbandry is an important source of zoonotic and foodborne disease agents that spread from pigs, poultry, cattle and other livestock, by direct contact or through the environment. In 2015, WHO estimates the median global number of foodborne illnesses and deaths at 349 405 380 and 187 285, respectively (WHO/FDBERG, 2015). Food allergy is also a major health problem across the world with 200 to 250 million people suffering globally (Pawankar, 2014). At least thirty percent of the food allergens originate from food animals, leading to 60 to 75 million suffering from animal origin related allergenic cases (Pawankar, 2014; Bøgh & Madsen, 2016).

Reducing meat production will have many benefits for all people who inhabit our planet. The geniuses of the past were able to perceive this. Nowadays this has become a global agenda for all. Together with other priorities, only through drastic reductions in meat consumption will we be able to achieve United Nations' Sustainable Development Goals 2 No Hunger and 3 Good Health for all.

CONCLUSION

In the William Shakespeare's *Twelfth Night* comedy, one of the not so wise personalities Sir Andrew reasons his lack of intelligence with his diet: "But I am a great eater of beef, and I believe that does harm to my wit"[9] (Act I, Scene III). Leaving the Elizabethan age common belief that eating too much meat makes you a meat-head (Despain, 2012) aside and the Shakespeare's mockery, it is difficult to link the expansion of the human brain with one particular food or a food preparation method. Similarly, there is not a single food which can be given the status of evoking creativity and geniality.

The matter is too complex and whether there is a secret link or not between genius, creativity and (not) eating meat is likely to remain debatable. What this chapter showed is that excluding meat from human diet does not affect intellectual capacities and human brilliance. It is profoundly clear the dietary habits of the exceptional minds, mostly vegetarianism, deserve great attention, because these geniuses could see beyond the mundane habits of the present into the future.

"We are all born ignorant, but one must work hard to remain stupid"[2] – Benjamin Franklin's words are a call against ignorance. It is a statement that given the evidence about the destruction caused by meat production and consumption to the planet, its climate, species and people, continuing to be ignorant equals sheer stupidity. And you do not need to be a genius to understand this.

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KEY TERMS AND DEFINITIONS

Animal Protein: Protein present in animal tissues.

Brain: An organ inside the skull which controls thought, memory, feelings and activity.

Creativity: Tendency to generate or recognize ideas, alternatives or possibilities that may be useful in solving problems, communicating with others, and entertaining others and ourselves.

Genius: A person with exceptional intellectual or creative power or other natural ability.

Health: A person's mental or physical condition; also, the state of being free from illness or injury.

Nutrition: The process of providing or obtaining the food necessary for health and growth.

Vegetarian: A person who does not eat meat, fish and other animal products, especially for moral, religious, environmental or health reasons.

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